REMARKS

Claims 1-15 are pending. No amendments have been made to the claims. No new matter is added.

The Examiner required amendment to the specification to include continuing data from the counterpart PCT application. Applicants have amended the first page of the specification to include this data.

The Examiner rejected claims 1-15 under 35 USC 103(a) as being unpatentable over Uno et al., Tetrahedron Letters (1985) ("Uno") in view of Gorelik et al., Zhurnal Organicheskoi Khimi (1992) ("Gorelik"). The Examiner asserts that Uno teaches a reaction of a di-iodophenyl with malononitrile in the presence of sodium hydride and a platinum catalyst which differs from the claimed invention by Uno's explicit teachings of the presence of a hydroxide of an alkali metal or a mixture of hydroxides of alkali metals. However, the Examiner alleges that Gorelik's teaching of a malononitrile addition reaction using a differently-substituted ring reactant and KOH provides the sufficient motivation to modify the reaction of Uno to include the hydroxides required by the instant claims. According to the Examiner, the combination of Uno and Gorelik renders the rejected claims prima facie obvious since the references teach or suggest the elements of the rejected claims with a reasonable expectation of success. Applicants respectfully traverse.

The **present invention** relates to the preparation of phenyl malonic acid dinitrile which, according to claim 1, is characterized by the features:

- **phenyl containing a leaving group**
- **hydroxide of an alkali metal or a mixture of hydroxides of alkali metals**
- **Pd-catalyst**

Uno et al describe the synthesis of phenylene di-malonic acid dinitrile with the features:

- **phenylene di-iodide, where iodide is the leaving group**
- sodium hydride as the strong base
- **Pd-catalyst**

Gorelik et al describe the replacement of the nitro and hydroxy group (as part of -COOH) by malonic acid di-nitrile with the features

- 1-nitro-anthrachinon-2-carbonic acid, where nitro is the leaving group
- **potassium hydroxide**
- no catalyst

The Examiner appears to argue that the combination of the teachings of Uno et al and Gorelik et al would lead to the process conditions selected and claimed in the instant process of the present invention. In particular, the Examiner appears to urge that the use of KOH and consequently the use of hydroxides of an alkali metal or a mixture of hydroxides of alkali metals in

the claimed process would be suggested by this combination. However, looking closer into the chemistry involved, it becomes evident that there is no motivation for the artisan to combine said teachings.

Note that **Gorelik et a**l use KOH as the base (which is not as strong as the NaH used by Uno et al) and do not need a catalyst to replace the nitro group by malonic acid dinitrile. The reason for this has to be seen in the chemical properties of hydroquinone: hydroquinone in its 1- and 4-position is more reactive than in its 2- and 3-position, and substitution reactions in these 1- and 4-positions can be effected easily. Therefore, in Gorelik et al, the nitro group, which is in 1-position, is replaced, whereas the COOH-group, which is in 3-position, is not replaced but modified only, under the conditions described; the hydroxy group rather than the complete carboxylic acid group is substituted by the nitrile in the Gorelik reaction.

It is interesting to note in this connection that according to *Chem. Pharm. Bull. 46, 1664-1668 (1988)* (enclosed) it is known that iodobenzene and bromobenzene cannot be converted into phenyl malonic acid dinitritrile under basic conditions without a catalyst, as no reaction at all occurs. In contrast to this, **Uno et al** successfully replace in di-iodobenzene the iodo atoms by malonic acid dinitrile. **Uno et al** are using for this reaction NaH as a very strong base (which is stronger than the alkali metal hydroxides) and, additionally, a Pd-catalyst.

Thus, taking into consideration the facts that

- on the one hand Gorelik et al concentrate on and limit their teaching to the very specific chemistry of an anthraquinone with activated ring positions 1 and 4, that differ in reactivity from positions 2 and 3, which enables the reaction to work in the absence of a catalyst and with a not so strong base,
- on the other hand, Uno et al need for their different chemistry, the reaction of di-iodobenzene with malonic acid di-nitrile, a very strong base such as NaH and a Pd-catalyst, and
- knowing that this reaction would not occur in the absence of the catalyst (from the teachings of *Chem. Pharm. Bull.)*,

it must be concluded that said teachings cannot reasonably be combined. The chemical properties of the substrates involved, and thus the required reaction conditions, are too different and thus fail to provide a proper basis for such a combination. Any conclusion that the KOH according to Gorelik et al can be used instead of the NaH in the process of Uno et al appears to be very arbitrary and one taken only from hindsight knowledge of Applicants' invention. As such, the rejection cannot stand.

In light of the Remarks set forth herein, Applicants respectfully request withdrawal of all rejections and request that the Examiner allow all of the pending claims.

Respectfully submitted,

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